Trifolium jokerstii (Leguminosae, Papilionoideae), a New Species from Butte County, California

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ABSTRACT. *Trifolium jokerstii* (Leguminosae, Papilionoideae), a new species from Butte County, California, is described and illustrated. It is morphologically similar to *T. barbigerum* and *T. grayi*, from which it differs in stipule shape, flower color, seed size, and lack of pubescence.

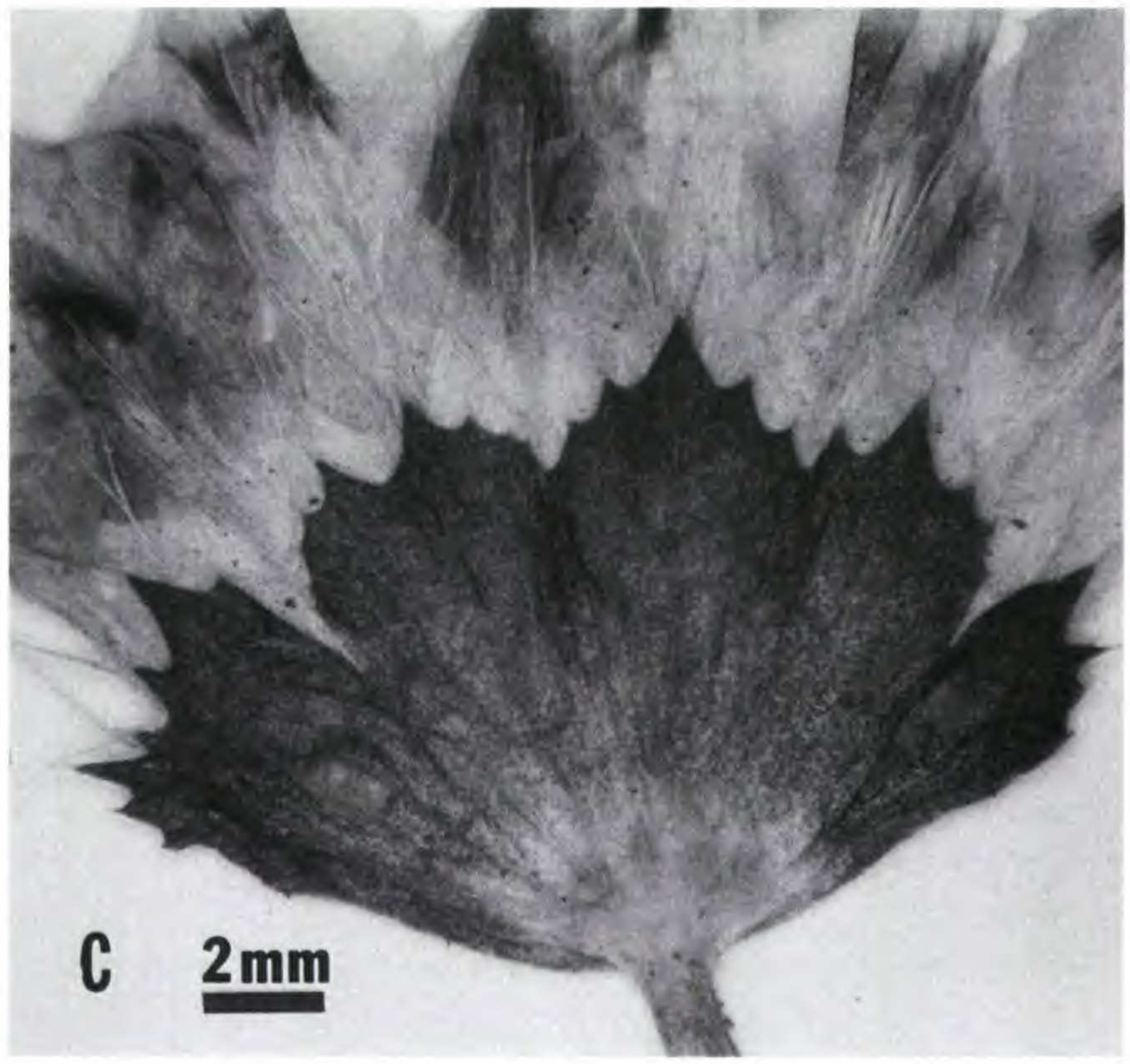
The genus *Trifolium* (Leguminosae, Papilionoideae) consists of approximately 240 species found in mainly temperate and montane regions, with areas of "Mediterranean" climate (the Mediterranean basin, California, and Chile) being considered centers of diversity in the genus (Zohary & Heller, 1984). In North America, 93 species are known (Kartesz, 1994), of which 64 are native and 29 are introductions. Isely (1993) recognized 45 species in California, 32 of which are native to the state; of these, 14 belong to section *Involucrarium*, a New World endemic section characterized by the presence of an involucre of fused bracts subtending the inflorescence.

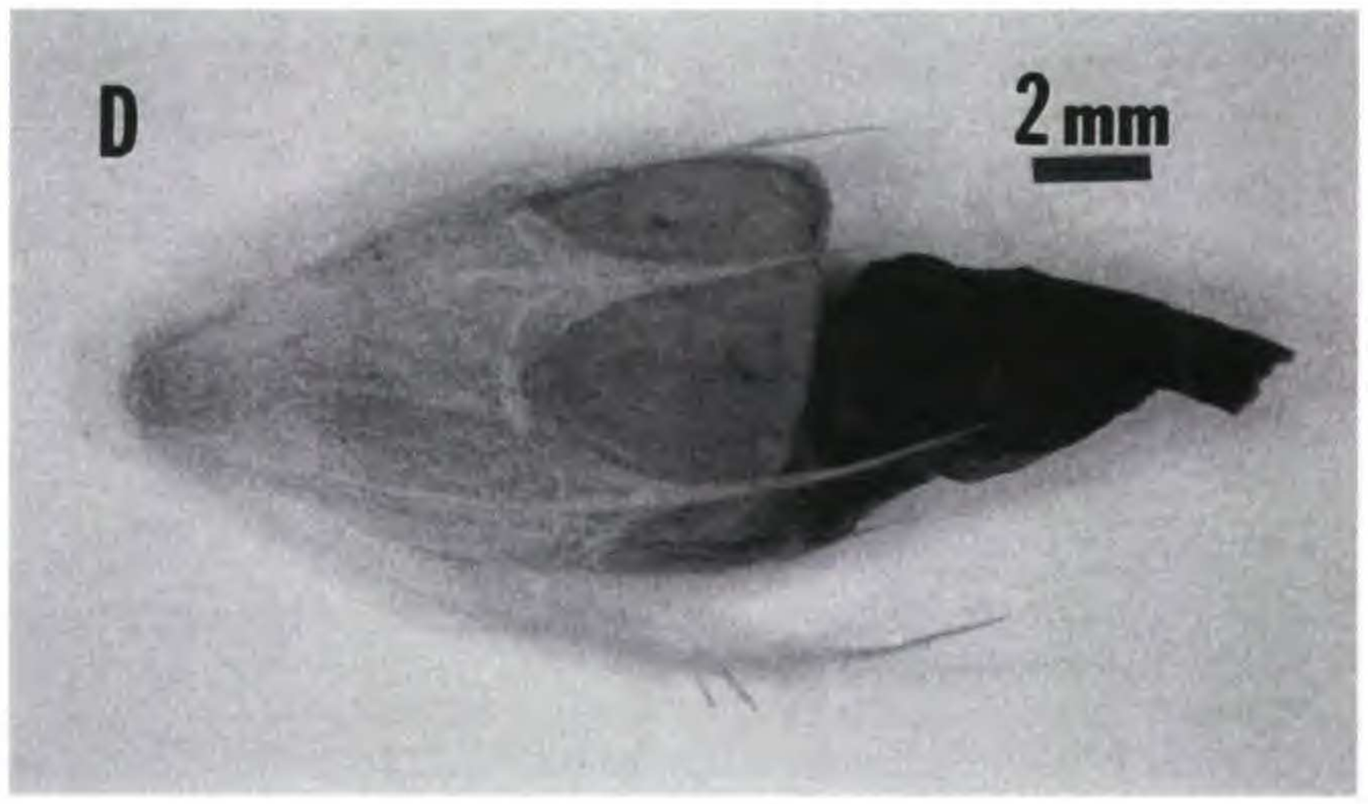
During the course of a revision of *Trifolium barbigerum* Torrey and related species of section *Involucrarium*, several specimens from the vicinity of North Table Mountain, Oroville, Butte County, in north-central California, were determined to represent an undescribed species. A single collection was examined by Isely and mentioned in his treatment of the genus for the *Jepson Manual* as a yellow-flowered variant of *Trifolium barbigerum* var. *andrewsii* A. Gray (Isely, 1993). The new species was also mentioned by Oswald and Ahart (1994) as possibly the same variety, with a comment that the plants might deserve taxonomic recognition. No collections of this taxon were mentioned by McDermott (1910) or Zohary and Heller (1984) in their monographs of the genus. The species is significantly different from both *T. barbigerum* and *T. grayi* Lojacono (*T. barbigerum* var. *andrewsii* A. Gray) and is described here as new.

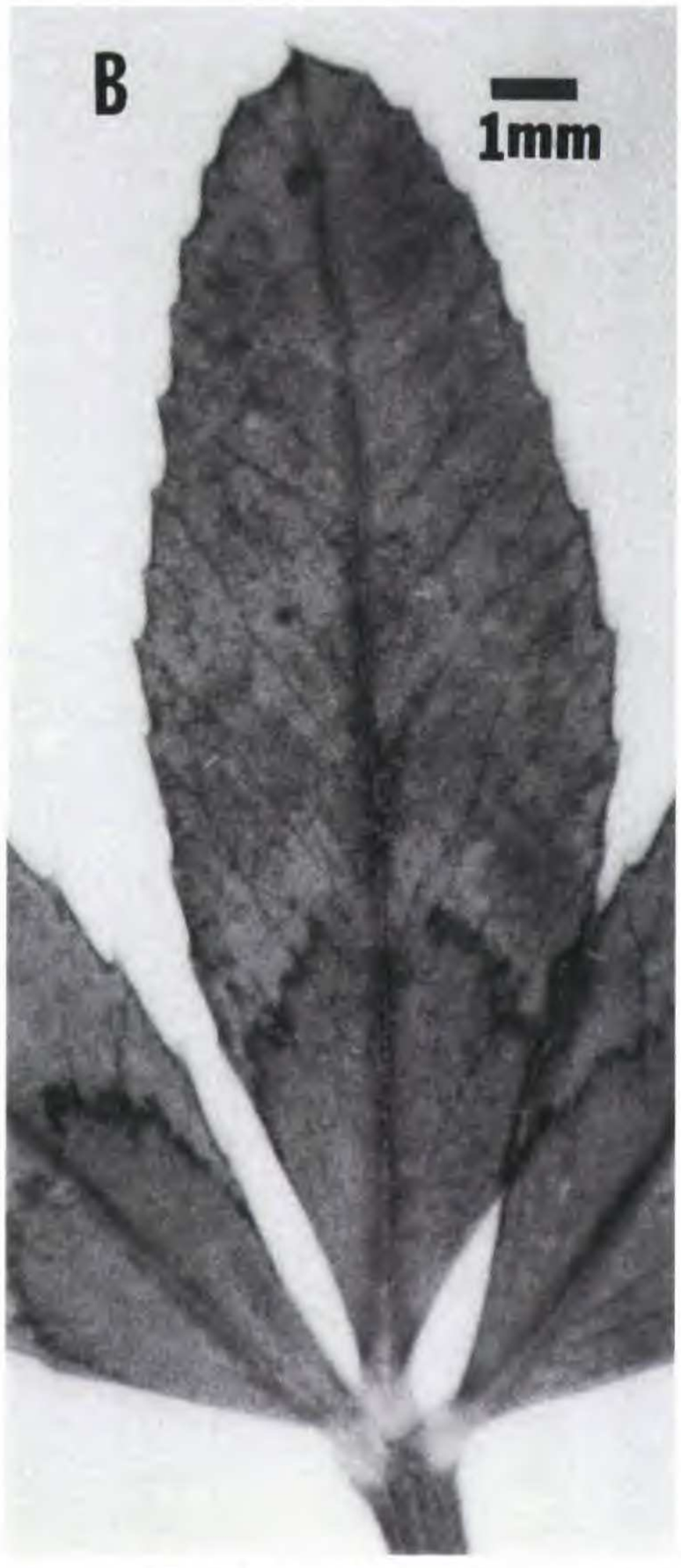
Trifolium jokerstii Vincent & R. Morgan, sp. nov. TYPE: U.S.A. California: Butte County, North Table Mountain, N of Oroville, 29 Mar. 1996, *M. A. Vincent 7227, Rhode & Snowden* (holotype, MU 177695; isotypes, F, ISC, MO, NY, RSA, UC, US). Figure 1.

Trifolium annuum, caulis erectis vel ascendenti et simplico vel ramoso, glabro; stipulis ovatis, serratis, persistentibus; foliolis ellipticis vel obovatis, serrulatis; capitulis semiglobosis; pedunculis foliis longioribus; involucris lobatis; lobis ovatis, dentatis; calycibus campanulatis, pubescentibus, tenuis; lobis simplicibus subulatis, plumosis; corollis luteis ad sulphureas. Affinis *T. barbigero* Torrey et *T. grayi* Lojacono; ab utroque caulibus et foliis glabris, stipulis ovatis, serratis, corollis luteis ad sulphureas, et seminibus 3.1–3.4 mm longis differt.

Erect-ascending annual with simple to branched glabrous stems to 20 cm, from a fibrous taproot. Stipules thin, pale to green, 8–13(–20) × 7–10 mm, rounded to acute and serrate at apex, persistent, adnate to the petiole, distinct or sometimes basally fused into a cylinder for ⅔ their length. Leaves trifoliolate, petioles to 90 mm, glabrous. Leaflets sessile, glabrous, serrulate to rarely nearly lobed, elliptic to obovate, (5–)8–17(–32) × (4–)6–8(–15) mm, with or without a prominent white to dark purple chevron. Inflorescence involucrate, subglobose, 10–30-flowered, 12–30 mm wide, peduncle longer than the leaves; involucre wide-campanulate to nearly flat, (13–)15–17(–22) mm wide, glabrous, lobed, the lobes rounded, toothed. Calyx 7–9 mm long, expanding in fruit, tube membranous, sparingly pubescent, campanulate, 5-nerved, oblique; teeth plumose, nearly as long as to slightly longer than tube, subulate-setaceous, the upper shorter than the lower, simple, lateral teeth simple to bifid, lower tooth bifid to trifid. Corolla 10–15 mm long, golden-yellow to sulphur-yellow; standard broadly ovate, inflated in fruit with a constricted throat above the mouth of the calyx; wings auriculate, longer than keel; keel with or without a purple spot on each side. Ovary glabrous, 4–5 mm







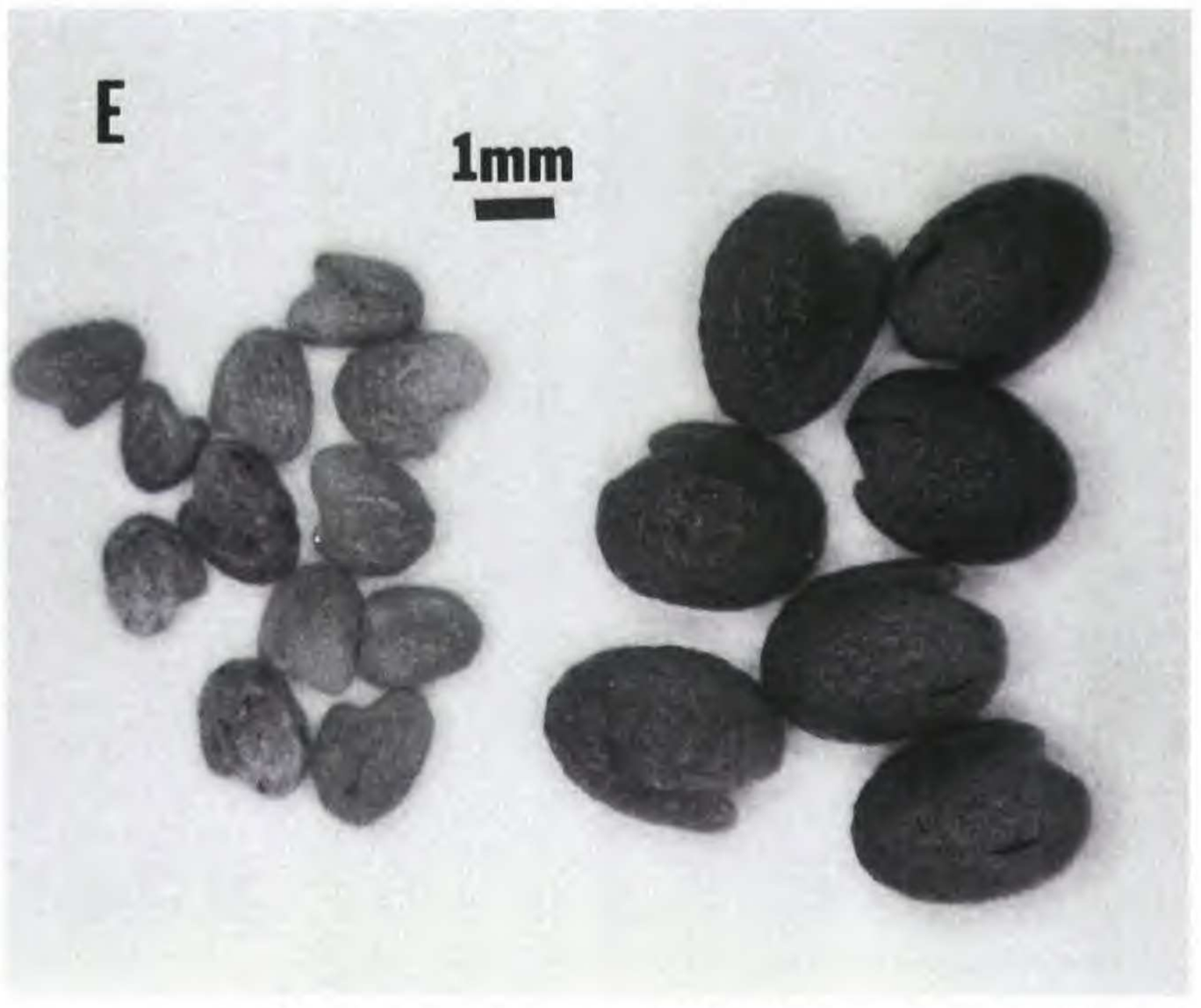


Figure 1. *Trifolium jokerstii* Vincent & R. Morgan. —A. Stipules (from *Ahart 7569 & Cunningham*). —B. Leaflet showing teeth and chevron (from the holotype). —C. Folded involucre, showing rounded, toothed lobes (from the holotype). —D. Inflated fruiting calyx and corolla (from *Morgan 2566c*). —E. Field-collected seeds of *Trifolium jokerstii* (right), and *T. grayi* (left), showing size differences.

long, ovules 2. Fruit 3.3–3.5 × 2.0–2.2 mm, stipitate, ovoid, (1–)2-seeded. Seeds 3.1–3.4 × 2.3–2.7 mm, dark brown, somewhat rough. Flowering March–May.

Trifolium jokerstii has affinities with *T. barbigerum* and *T. grayi*. It differs from the former in the larger size of all parts. It can be distinguished from both species by flower color, lack of pubescence on the stem and foliage, stipule shape, and seed traits. Flowers of *T. barbigerum* and *T. grayi* are lavender to purple with white to cream tips, or rarely all white. Stipules of *T. grayi* are acute to attenuate at the apex, with very large, jagged teeth, while stipules of *T. jokerstii* are rounded to slightly acute, with smaller teeth. Seeds of *T. grayi* measure 1.6–2.0 × 1.4–1.5 mm and are pale brown and mottled, while those of *T. jokerstii* are much larger (there are no intermediates) and are dark brown. Petioles of the cotyledons of *T. jokerstii* are from 13 to 25 mm long, while those of the cotyledons of *T. grayi* are 3–10 mm long.

The two known populations of *Trifolium jokerstii* are in Butte County, north of Oroville, and are at least 100 miles from the closest known population of *T. grayi*.

Allozyme banding patterns (Vincent, in prep.) are vastly different in *T. jokerstii* from those of both *T. barbigerum* and *T. grayi*, and bear out the distinctness of this species.

The new species is named in honor of the late James D. Jokerst [1956–1995 (Beedy & Preston, 1996)], who collected the earliest known specimen of the clover and published a flora of North Table Mountain (Jokerst, 1983). The common name "Butte County Golden Clover" was coined for the taxon by Oswald and Ahart (1994).

Paratypes. U.S.A. **California:** Butte County, North Table Mountain, N of Oroville, 2 Apr. 1995, *L. Ahart 7569 & Cunningham* (CHSC, MU), 30 May 1995, *L. Ahart 7583* (CHSC), 29 Mar. 1996, *M. A. Vincent 7205, Rhode & Snowden* (GH, ISC, MO, MU, RSA), *7215* (GH, ISC, MU, RSA, UC), *7219* (MU), *7240* (MU); along Cottonwood Road, N of Oroville, 7 Apr. 1989, *L. Ahart 6202* (CAS, CHSC, MO, R. Morgan personal herbarium, UC), 29 Mar. 1985, *J. D. Jokerst 2186* (ISC), 29 Mar. 1996, *M. A. Vincent 7245, Rhode & Snowden* (F, ISC, MO, MU, RSA, UC, US); cultivated plant, 12 May 1995, *R. Morgan 2566c* (MU, R. Morgan personal herbarium).

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